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A Resume Of Research On Gummosis In Florida

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(Portion of Address Delivered at
Citrus Growers' Institute at Camp
McQuarrie.)

Although gummosis has been widely distributed and troublesome in Florida for many years, the exact cause and nature of this trouble are still very imperfectly understood. What is designated under the general term of gummosis in reality comprises a number of more or less related troubles, similar in appearance and effect upon the trees, but with a variety of causes. The basal form of gummosis occurring principally on the sweet orange and commonly known as foot rot was shown several years ago to be caused by a soil-inhabiting fungus, *Phytophthora parasitica*. Aside from foot rot and psorosis, no form of gummosis appears to be of any economic importance on oranges in Florida. The brown rot form of gummosis (*Phytophthora citrophthora*) responsible for a large part of the gummosis of citrus trees in California and several other citrus-producing countries does not appear to occur on trees in Florida, although the fungus has been isolated by Fawcett (1), and more recently by West, from decaying citrus fruits lying on moist soil in a few localities. Apparently the high temperatures prevailing in Florida are not conducive to the development

of this fungus. The present discussion of gummosis excludes foot rot and psorosis and is limited to the forms occurring chiefly on grapefruit, tangerine, cultivated lemon, and Perrine lemon and Tahiti lime. The present status of psorosis was presented by the writer (3) in the June number of this magazine.

Grapefruit

Gummosis is of rather common and widespread occurrence on grapefruit trees but rarely develops while the trees are young. The disease usually is confined to the trunks and main limbs, although in one block of actively growing young trees, where a bad outbreak of gummosis was observed several years ago, the trouble occurred even on the small branches. Some cases of gummosis of grapefruit have been found to be caused by one of the stem-end rot fungi, *Diplodia natalensis*, which commonly attacks trees through injuries to the bark caused by unpainted pruning wounds and various other agencies, but these appear to be in the minority. This fungus frequently invades the wood also and may develop faster through the wood than in the bark. Other fungi which have been isolated from the discolored interior wood of trunks and limbs of grapefruit trees attacked by gummosis include *Phemopsis citri*, *Fusarium*, (chiefly *F. solani*), *Betryodiplodia diplocarpon*, and an undetermined species of *Coniethyrium*. After the in-

terior wood of the trunks and main limbs becomes invaded and discolored by these organisms, the trees naturally decline rapidly. Where this complication takes place the bark-scraping method of treatment naturally will prove futile in arresting the progress of gummosis or the decline of attacked trees. Fortunately, however, in the majority of cases of gummosis in grapefruit the interior wood of the trunks and main limbs does not become invaded and discolored by fungi, even after the disease has been more or less active for a number of years.

In the majority of cases of gummosis on grapefruit trees examined by the writer over a period of several years it is apparent that the gumming develops through cracks formed in perfectly sound, healthy bark that is free from any discoloration whatever at the start of the trouble. The trouble frequently develops more or less simultaneously at a variety of points on the trunks and main limbs of individual trees, often with such rapidity as to be quite alarming to growers, and without any apparent reason. Such cases appear to have their inception in some deranged or unbalanced condition of nutrition in which gumming tissue instead of normal wood elements forms between the wood and the bark. After gum accumulates at various points under the bark with sufficient pressure to

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Weather And Its Effect On Florida Agriculture In 1938

With the opening of another citrus shipping season and the approach of another winter, it is interesting to review weather conditions during the year 1938 and the effect of such conditions on the agricultural and horticultural production of the state. The following review of the climatic conditions prevailing during the year 1938 is given by Mr. Walter J. Bennett, Meteorologist, U. S. Weather Bureau, Jacksonville.

Florida is a large state, and wide differences in temperature and other conditions may occur in different sections. One section may be very dry, while another is experiencing heavy and damaging rains. So in discussing this subject we are compelled to use rather broad generalities.

The year 1938 started out with some handicap, for severe frosts in late November and freezing weather early in December had done much damage to truck and some damage to citrus. From the middle of December until near the end of January however, weather conditions were favorable, and surviving and replanted truck made good progress. By the latter part of January large shipments were being made of all kinds of winter vegetables, strawberries, and citrus fruit.

The third cold spell of the winter overspread the state January 27th to 29th, with freezing temperatures extending into the southern interior as far as Homestead. Tender truck in the northern and central portions of the state and in the southern interior suffered considerable damage. Strawberries were badly hurt and shipments were suspended for several weeks. The shipment of winter vegetables was cut short, except from the coastal regions of the south. Many unprotected groves in the northern part of the citrus belt suffered loss of fruit and bloom, and some young growth was killed. Groves protected by firing suffered little, if any, loss, and growers in many instances were able to protect at least a part of their truck and strawberries.

Although frosts in late February did some damage in northern sections, the months of February, March and April were generally warm and dry and truck recovered rapidly and shipments of vegetables and strawberries increased.

More unusual than the cold spells, which the Florida grower has learned to expect occasionally, was the deficiency in rainfall in the early months of the year. This deficiency really began in December; so the year opened with soil moisture depleted. The first four months of the year were abnormally dry, the rainfall for the state averaging only about half the normal. The dry weather slowed up the development of spring truck, and caused a sharp decline in shipments. Citrus groves suffered severely from the drought, where irrigation was not practicable. Leaves were wilting and falling; fruit, both old and new, was falling; and young trees were dying. By the latter part of May it was said that Florida was suffering the worst drought in years and dire prophecies of disaster to the citrus groves were made. The drought was finally broken by good rains during the last week in May. Many young trees had died and the older trees had suffered severe shock, but abundant rains during the last week of May and the month of June brought recovery to the trees generally and forced the heaviest June bloom in many years. Much of this bloom set good fruit, although sizes and dates of maturity are showing wide variations.

In northern Florida, the drought was less severe. Cotton made fair growth, and the boll weevil was not particularly active. Tobacco suffered little from blue mold and produced a large crop of excellent quality. Early corn and sweet potatoes did very well.

The weather during June and July was generally favorable, with abundant showers and temperatures somewhat below normal. August was hot and dry; the driest August in 40 years. Cotton was adversely affected, but still produced a fairly good crop. The weather during September was favorable for cotton picking, haying, and preparation of the soil for fall planting. Timely rains were favorable for setting out strawberries, celery, peppers, tomatoes, and other truck and helped the growth of beans, turnips, squash and other vegetables planted earlier. Satsumas and Japanese persimmons matured fruit of good quality.

The rainfall of October was only

slightly above normal for the state as a whole, but heavy rains damaged truck and strawberries over the southwestern countries, necessitating much replanting. East coast counties and extreme northwest Florida were rather dry. Shipments of fall truck increased; citrus groves were in good condition; and fruit was beginning to mature and color. A good crop of pecans was harvested. At the close of October frosts occurred in the extreme northwest, with freezing temperatures in northern Escambia County. Apparently little damage resulted.

Abnormally warm weather marked the first three weeks of November, with many places reporting the highest temperature on record so late in the season. This prolonged summer weather was abruptly terminated on the 25th, and cold weather prevailed the remainder of the month. On the 28th, freezing temperatures were reported quite generally over the northern half of the state, with considerable damage to tender truck. Temperatures as low as 20° occurred in the extreme northwest. The southern half of the state suffered little, if any, damage, and the cold weather helped to color and sweeten the citrus fruit. Shipments of all kinds of fall vegetables increased by the close of November and some strawberries were being picked and shipped. Sugar cane was being harvested and ground, and a good crop was reported.

Following a dry November, December also was very dry. The soil moisture was depleted, and some sections needed rain very much. Truck and strawberries were retarded by the dry weather, but large shipments of vegetables were made, and strawberry shipments were increasing. Citrus groves were dry, but were still in good shape. December weather was rather cool, and on the 10th and 11th, freezing temperatures extended as far south as the Lake Okechobee region, with some temperatures as low as 25° in the citrus belt. Tender truck was damaged to some extent, and in a few low spots in the groves ice was reported. But the cool weather sweetened the fruit and shipments were increasing.

The year 1938 was not particularly favorable or unfavorable. Tempera-

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Florida Citrus Shipping Season ... Opens Later Than Usual

With the decks cleared for action, the Florida citrus industry is ready for the start of the new season — a season which it is hoped will bring a profit to everyone concerned.

The legislature overhauled the industry's legislative machinery a few months ago, and the citrus commission, complying with mandates in new laws, has issued all necessary regulations.

Just how much fruit will be produced in Florida during the 1939-40 season is unknown at this time, but government condition reports thru out summer months have indicated a drastically lower grapefruit crop, about the same quantity of oranges and a somewhat lesser crop of tangerines. The first federal estimate will not be made until around October 10, but is expected to bear out the lower grapefruit yield as forecast by condition reports.

The new legal provision that fruit must show "a natural break in color" apparently held much fruit on the tree. Rains throughout the citrus belt are said to have delayed the natural coloring process somewhat.

A rush of applications by persons desiring to become citrus fruit dealers is now on. With 200 applications received by Sept. 10, prospects that 400 more will have to be acted upon in the near future. Six hundred such licenses were issued last season and an equal number is expected this season.

The citrus commission's new advertising and sales promotional program is ready to go into operation, after being approved by the commission a short time ago. First advertisements, now in process of preparation, will appear in mid-October. Work also is progressing on new display material and other store aids on Florida citrus, and this material will be ready for distribution in quantity in October.

More than 100,000 carloads of Florida citrus went to northern markets in fresh form last season, by far the biggest amount in the state's history. This included 70,000 carloads of oranges, 29,500 carloads of grapefruit and 7,500 carloads of tangerines. While no more of last season's crop is going north in commercial quantities, the inspection bureau is still issuing certificates on such fruit which is being trucked into canning plants and to supply local demand in Florida's large population centers.

This is not unusual, however, as the inspection bureau has experienced a slight overlap from one season to the other on such shipments for several years. All records were broken, however, for the amount of fruit shipped north in June and July, and for the length of the shipping season.

Just what effect the European war will have on fruit prices this season is still a matter of conjecture.

Most citrus leaders forecast a strongly buoyant effect on market prices, based on belief war is certain to bring at least a temporary upswing in business in the United States. Such a rise would be reflected in citrus prices.

Canners are watching the European situation closely, because of the effect war will have on export of can-
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THE CITRUS OUTLOOK

The 1939 citrus shipping season opens with a feeling of optimism on the part of Florida citrus growers and shippers. There are several reasons, some tangible and some intangible, for this better feeling on the part of Florida growers.

First, probably, is the fact that the present crop, so far as grapefruit is concerned, is many million boxes less than the record-breaking yield of a year ago. This in itself should mean a higher per box price than the very unsatisfactory prices received for the crop last year. While the orange production of the state will probably be about the same as last year, it is believed that the quality will be higher and that sizes will run more to the market demands.

Second, there is a feeling that the new maturity laws, which are being strictly enforced, will be of great advantage in keeping immature and unfit fruit from the market. An evidence of this is seen in the fact that whereas in previous years much fruit was rushed to market immediately after the first of September, no shipments were made this year until September fifteenth — and very little has moved so far. The new requirement that no fruit may be put through the coloring rooms until it shows a "break" in color has served to retard shipments far beyond the usual date and should result in a better reception in the markets of the North.

Third, and while this is an intangible reason for optimism, there is a general feeling that the European war may have a beneficial effect upon the price of citrus fruits of all kinds. There is a belief that citrus fruits, along with other food products, will be inclined to advance under the pressure of war buying.

Fourth, the condition of the crop in other American citrus producing sections is such as to provide encouragement to Florida citrus growers. With a crop which promises to be of superior quality, the Florida grower is in excellent position to meet the competition of other sections which have not been so abundantly favored by nature.

As an evidence that this fourth reason for optimism is not unfounded is the report of a prominent Florida citrus grower who has just returned from an extensive trip through the citrus producing regions of California and Texas. As a result of his observations this traveller says:

"In regard to California, the Valencia crop now being marketed runs very largely to small sizes and the quality is not good. The crop is considerably under that of last year. This should give us a good market for our early oranges.

"In regard to Texas, the growers there have experienced a very prolonged drouth and as a consequence have very little or no crop where there is no irrigation, and even on irrigated groves the size of the fruit is small and of inferior quality. The crop is considerably less than last year. It therefore seems that our competition for grapefruit from Texas is much less than it has been and with our short crop this year, there is every indication that there will be a good market for fresh fruit."

Taking all these factors into consideration, it would seem that the Florida grower of citrus fruits has reason to look forward to a season of much greater profit than he has enjoyed for some years past. Certainly a feeling of optimism exists, whereas in recent years the opening of the shipping season has found the Florida growers pessimistic and discouraged.

GRAPEFRUIT IN NEW ENGLAND

Florida grapefruit regained a commanding position in New England last season, wiping out a loss in consumption reported the year before and exceeding all other years in the amount of grapefruit shipped to the six states in the New England group.

Substantial gains also were recorded in oranges and tangerines, but the increase in grapefruit was more pronounced than in other citrus fruits. Several factors are believed to have contributed to this remarkable gain, including discovery of scurvy in Maine and resultant widespread publicity given citrus fruits as a preventative and cure of this disease at that time. The federal government purchased a considerable quantity of citrus following the discovery of scurvy and shipped it to the affected areas.

Consumption of grapefruit in New England had dropped from 2,429 carloads in the 1936-37 season, to 1,595 carloads in 1937-38. Last season, according to the citrus summary issued by the federal-state market news service, 2,647 carloads of Florida grapefruit went to Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.

In Maine, only 10 cars were recorded during 1937-38 while last season 66 cars were sent there, an increase of more than 500 percent. New Hampshire took 18 cars last year compared with one car the year before. Vermont used 14 cars, compared with three the year before.

Massachusetts took 1984 carloads, an all-time record, as compared with 1,184 cars in 1937-38. Rhode Island took 169 cars as compared with an even 100 cars the year before, and Connecticut received 396 cars as compared with 297.

Possibly the exceedingly low price prevailing on grapefruit last season may have had some influence on the increased use in the New England territory, but it is quite evident that other factors also played a part in the exceptionally heavy increase. New England may be safely counted upon as a liberal user of Florida citrus in the years to come.

Heavy rains during August retarded the coloring of citrus fruit — which may prove to have been a "blessing in disguise."

A RESUME OF RESEARCH ON GUMMOSIS IN FLORIDA (Continued from page 5)

rupture it longitudinally the gum exudes and runs down or drips from the surface of the bark, often accumulating in masses of considerable size if not washed away by rains. In some instances the outbreak of gummosis is merely temporary and it may cease as suddenly as it began, often with no particular treatment. In other cases the trouble becomes persistent or chronic and may continue activity for a number of years. In the less aggravated cases the places where the bark splits and exudes gum soon heal. In others the bark may become invaded by various organisms which kill areas down to the wood and stimulate additional gum formation. Of a total of 110 cultures made from the discolored bark adjacent to gumming areas on the trunks and limbs of grapefruit trees over a number of years, 34 have yielded *Diplodia natalensis*, 23 *Fusarium solani* and other species of *Fusarium*, 16 bacteria, 2 *Phomopsis citri*, 2 unidentified fungi, and 33 remained sterile. However, it appears that only the first of these organisms can be regarded as the primary cause of the trouble, and more often it is purely secondary. Sometimes gummosis lesions progress but very slowly and heal and break out intermittently. Occasionally, however, in what appears to be but a mild case of gummosis, *Diplodia natalensis* or some other fungus may invade and kill an extensive area of bark with considerable rapidity, and even invade the underlying wood as well. Gummosis is an uncertain proposition since one can rarely predict whether new outbreaks will heal without any particular trouble or become aggravated and chronic and threaten the life of the affected trees.

Observations over a period of several years in various parts of the State and annual inspections of the same gumming trees in certain groves for 10 consecutive years shows that gummosis in grapefruit tends to be unusually active in certain years and less so in others. In general it may be stated that this trouble appears to develop most widely about the State following injury of the trees by drought, cold, flooding or waterlogging of the soil, hurricanes, or other adverse influences which give them a severe shock or setback. Trees which have been injured by cold frequently have both the wood and bark extensively invaded by *Phomopsis citri*, which may be accompanied by more or less gum

formation.

On the other hand, instances have been noted where blocks of grapefruit trees, particularly young, actively growing ones on low, heavy soils, have developed bad cases of gummosis following heavy applications of nitrogenous fertilizers. The reduction of these and the application of potash to give a more balanced nutrition appear to have proved beneficial in such cases.

Outbreaks of gummosis appear to be especially prone to occur in groves on heavy, plastic soils in the drainage district west of Vero Beach, where the subsoil contains marl and shell, but the surface soil often is decidedly acid in reaction. In both this section and other parts of the state a number of instances have been observed from time to time where bad and persistent outbreaks of gummosis suddenly cleared up, both with and without the bark-scraping method of treatment. In all such instances observed, the correction of gummosis followed applications of various soil amendments in addition to the regular fertilization program. In some cases the sudden checking of bad cases of gummosis appeared to be correlated directly with the correction of soil acidity through the use of sources of lime. Applications of borax to the soil in groves in the Vero Beach section have not shown any benefit in the correction of gummosis on either grapefruit or tangerine. It is believed that the proper fertilization of citrus trees with respect to the soil and soil reaction is a line of activity well worth investigation with respect to the occurrence of gummosis in many of our Florida groves. No evidence has been secured to support Fawcett's purely hypothetical assumption (2, p. 203) that the Florida form of gummosis on grapefruit, which is often difficult to distinguish from psorosis, is caused by a virus.

The writer's observations and investigations on gummosis of grapefruit in Florida indicate that while some of it is caused by purely patho-

logical agencies, much of it appears to originate by purely physiological means, after which the trouble may be aggravated by various fungi. As further evidence of the claim that gummosis is not necessarily caused by organisms alone may be cited the readiness with which certain chemicals may stimulate gum formation in citrus trees. It has long been known that excessive concentrations of copper sulphate in the soil or injections of this chemical into the trunks of trees frequently induces copious gum formation. It has been the experience in California that in some cases fumigation with hydrocyanic acid gas and the spilling of cyanide or its products on the roots will also induce gum formation.

Tangerine

Tangerine trees are extremely susceptible to the bark-scaling form of gummosis in which the exudation of gum is confined to a few scattered drops or gum-infiltrated areas of bark at the margins of the lesions. The same trouble also occurs on the mandarin but these trees are vastly more resistant to it. Tangerine trees commonly have had bad cases of this disease for several years without the life of the trees being seriously affected or their crop production curtailed. The disease occurs chiefly on the trunks and main limbs, but sometimes also on the upper limbs. It is of very widespread and common occurrence throughout the citrus region of the State. In many of the groves or blocks of tangerine trees nearly every tree may be affected, while in others the trees often appear quite free from the trouble. In one tangerine block, where the trees have been kept under observation for more than a decade, it is apparent that the bark disease develops with greater virulence in some years than in others, but it has not been possible to correlate this varying severity of the disease with the weather or other conditions. The lesions, which are usually rather superficial in their development, yield with

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Federal "Stamp Plan" Studied By Citrus Commission

Leaders of Florida's citrus industry are closely watching developments in the federal government's new system of distributing relief commodities, known as the "stamp plan," and wondering just what effect it will have on next year's FSCC purchases in Florida.

Under the "stamp plan," now in operation in several cities, relief families are furnished with blue stamps with which they can purchase any commodity on the government's surplus food list. In some cities, the family must buy \$1 worth of orange colored stamps to receive one 50-cent blue stamp. The orange stamps are used to buy the family's regular food purchases. In Birmingham, however, the plan was changed and a 50-cent blue stamp is furnished eligible families for each member per week, without the necessity of purchasing the orange stamps.

Up until recently, oranges and grapefruit were among surplus commodities which could be bought with the blue stamps. Citrus was removed from the surplus list on July 13, as Florida neared the end of its shipping season.

The stamp plan was started in Rochester, N. Y., on May 16; in Dayton, Ohio, on June 5, and Seattle, Wash., on July 3. Birmingham is the most recent city where a trial is being made. Among foods placed on the surplus list by the government are rice, cabbage, fresh peaches, fresh tomatoes, fresh green peas and onions, except green onions, butter, shell eggs, corn meal, dried prunes, dry edible beans, whole wheat and whole wheat flour. The list is revised periodically.

Figures are being sought to determine whether the new method of commodity distribution will have any adverse effect on consumption of citrus by relief clients. While the plan has not been in operation long in any city, it is believed Rochester, where the first trial was made, will give some indication of the upward or downward trend of citrus consumption under this plan.

Formerly, the federal government purchased surplus commodities outright, and turned them over to state welfare boards for actual distribution. Under the stamp plan, the groceryman receives the regular retail price for the commodity and takes the stamp to any bank where it is accepted as cash. This gives the gro-

ceryman his regular margin of profit on relief products, the government absorbing this item along with transportation and all other charges when it redeems the stamp at its face value.

Sales promotional men of the Florida citrus commission reported retail outlets were highly pleased with the plan, and a considerable portion of the blue stamps were used for citrus, while this fruit was on the eligible surplus list.



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Citrus Commission May Designate Growers-Shippers League

The transportation committee of the Florida citrus commission has under study at this time a proposed resolution which would designate the Growers and Shippers League of Florida as an agent of the commission in handling any transportation rate matters which may arise in the future. This committee, headed by Harry D. Ulmer, is expected to make its report to the commission in the near future.

Authority for the commission to enter rate battles where citrus is involved is contained in a new law. Up to 5% of the advertising funds collected on citrus in Florida may be spent in such effort.

Even if adopted, it was emphasized the resolution would still retain full control in the commission of all rate matters. Each situation which arose would be considered on its individual merits, and if the commission felt representation or the filing of briefs were necessary, it would instruct the Growers and Shippers League, or any other agent it might designate, to do so. The commission would pay whatever compensation it felt was reasonable for attorneys and other work involved on each individual matter.

The commission could institute rate studies on its own initiative, or could accept recommendations made by its rate agent, it was pointed out. The procedure probably will be for the commission's transportation committee to confer with the rate agent or agents on each problem which arises, and make its report to the citrus board as a whole. Determination then would be needed for that particular rate effort.

Florida citrus canners advised the commission they intended to appoint a transportation committee which would also confer with the commission's transportation group on any rate matters involving canned citrus.

Efforts of the commission on rate matters must be carefully restricted to citrus, it was emphasized, and no attempt can be made to cover other agricultural products. Representatives of the commission rate group, the canners and the Growers and Shippers League will work out minor changes to be made in the resolution designating the league as an agent of the commission, for presentation to the whole citrus board at its next meeting.

Jaycees To Again Aid Citrus Growers

Winter visitors will be given helpful advice on oranges and grapefruit, particularly the selecting of good fruit, if plans for a mass meeting early in 1940 now being considered by the St. Petersburg Junior Chamber of Commerce are completed.

Suggestion for such a meeting was made by William Kenmuir, chairman of the citrus committee of the St. Petersburg Chamber of Commerce.

The Jaycees organization indicated that it would sponsor the meeting as part of its cooperation in the second annual Florida Jaycees citrus drive, to be conducted throughout Florida in January and February.

Former Governor Doyle Carlton, citrus grower and official in the Florida Citrus Growers, Inc., has indicated he would accept an invitation to address the mass meeting. Other speakers will be obtained, and an educational program worked out to acquaint Florida's visitors with the state's biggest industry.

Wilbur Casey, chairman of the St. Petersburg Jaycee citrus committee and also a member of the state citrus committee of the Florida Jaycees, said his organization would start at once to develop plans for the gathering. The Florida citrus commission and Florida Citrus Growers, Inc., will cooperate in every way possible.

"St. Petersburg has a large winter visitor population," Mr. Kenmuir pointed out, "and we can get several thousand of them to attend such a meeting. It is a splendid opportunity to stress the superiority of Florida's fine fruit and to tell them just how a real juicy, thin-skinned Florida orange, grapefruit or tangerine can be selected."

Except for Mr. Carlton as principal speaker, no other details of the meeting have been worked out so far. The Jaycees are considering the feasibility of serving free citrus juice, but this and other features are still under discussion.

If the St. Petersburg meeting proves successful, Jaycee leaders said it was likely many other cities in Florida would hold similar meetings to take advantage of the presence of winter visitors in the state to advertise Florida's fruit and conduct a brief but intensive educational campaign.

CITRUS GROWERS HOPE TO PROFIT FROM WAR SALES

(Continued from page 3)

the commission confers with the Am-

THE CITRUS INDUSTRY

erican government on arrival. The National Canners Association and the Florida Canners Association also are directing their efforts to have canned products from Florida placed on the preferential list.

The future of Florida's fine export business on canned grapefruit to the United Kingdom was still in doubt today. Most canners feel that October will bring indications of what to expect next season. Some are optimistic and point out that the English people have accepted canned grapefruit as a staple item of diet, valuable from a health standpoint.

Loss of this British business would be a severe blow to Florida's citrus canning industry. It would necessitate canning less fruit, throwing an additional amount on the fresh fruit market, or trying to market the canned product now sent to England in this country or some other place.

Exports this season will amount to 1,500,000 cases of canned citrus, an increase of around 25 per cent as compared with last season. This

business amounts to the exportation of one case out of each three or four cases of canned grapefruit packed in Florida.

WEATHER AND ITS EFFECT ON FLORIDA AGRICULTURE IN '38

(Continued from page 6)

tures for the whole state and the whole year averaged just a little above normal, and the rainfall was between 76 and 80 percent of the normal. The cold of January, while severe, would not be classed as one of our big freezes; the drought of spring resulted in much less damage than was feared; there were no disastrous hurricanes or tropical storms; damage by heavy rains was limited to the southwestern districts and only on one occasion; autumn and early winter frosts were no more than average in extent and severity.

Rural retail sales in 1938 were about 82 per cent higher than at the bottom of the depression.

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The Growers' Own Page

Citrus Breeding And Research As A Means Of Correcting And Revolutionizing The Florida Citrus Industry

WHY are "green fruit" laws necessary? We know. But it has taken a certain citrus grower in Central Florida to find a better and far more efficient means of coping with this great problem.

This man recognized back in 1930 the necessity for drastic improvement in early varieties of citrus which would supplant those commercial varieties now being grown which in a number of respects do not meet trade requirements as early as have in the past prevailed to the detriment of the entire state. He thereupon set out to either discover in the field or thru his personal plant breeding research work, to correct existing faults in the early deal. I am informed that he is soon to have most important news to release, and indications point to his having been quite successful in his worthy endeavor. He has hinted at a certain type of round orange which is very early which far surpasses in flavor, and in premature "color-break" any orange now grown on a commercial scale; a fruit which he believes is equal to pineapple oranges in the full prime in February. Should this become an established fact, there need be no future fears of using artificial and unethical means of hastening maturity, and would indeed prove of tremendous importance for obvious reasons. Something in the way of a hint was dropped in the way of another entirely new orange maturing by October first of delicious taste, juicy, absolutely seedless, prolific, and which sizes averages 126's to 150's — a type of fruit which has been sought for many years.

No greater need exists within the citrus industry today than fruits which will take the place of varieties now grown and marketed during the very early season, those which would possess high solids and excellent MATURE flavors so desirable and necessary to improve our early markets.

This man has not stopped with these things and is tremendously ambitious. No less than seventeen (17) new and high-grade navel types have been unearthed. And in addition, hundreds of new navel crosses and

This department is devoted to the growers, for their use in giving expression to their views and a discussion of growers' problems. Any grower is welcome to make use of this department for the discussion of topics of interest. The only requirements are that the articles must be on some subject of general interest, must be reasonably short and must be free from personalities. The editor assumes no responsibility for views expressed, nor does publication imply endorsement of the conclusions presented.

hybrids are soon to be fruited from which development selections shall be made, and from which are expected several late-hanging Summer Navels, those maturing at various seasons having a high red colored rind and of very smooth skins, etc. Thousands of experiments are under way having to do with the development of entirely new and highly improved citrus fruits such as Limes, Lemons, Tangerines, Tangeloes, Satsumas, Temples (Seedless), Aurantiums, new types of Seedless Grapefruit widely varying seasons possessing remarkable flavors, and more desirable sizes in an extremely early variety, series of new navel oranges, and numerous hybrid fruits of considerable value, some of which are great curiosities. Certainly a most ambitious program for one single individual working alone with limited finances.

According to best information available, many of these new citrus fruits will soon be fruited, as well as those which were "accidentally" found in the field, and before long he promises to reveal much which I feel will interest many. I am not permitted to use his name as he prefers to remain obscure for the present at least, but from what I have seen of his work, it is my opinion he has accomplished a most valuable service to Florida.

N. J. DONALDSON,
224 Ernestine Street, Orlando,
Florida

Rats Cause Heavy Damage

Orlando, Florida
September 7, 1939

The Citrus Industry,
Bartow, Florida
Gentlemen:—

I wish to report great damage of both oranges and grapefruit including immature grapefruit, which has been caused by hordes of rats (Species unknown and may be a new importation from a foreign country) in a back yard in the city of Orlando.

This destruction has been going on now continuously for the past three years and steadily becoming worse and more alarming. Paul Phillips on Church street of this city reports similar conditions.

A number of these rodents have recently been shot but damage continues in a smaller degree. Grapefruit of past Spring bloom quite green have been eaten during June and July, and ever since. Large holes are eaten out of the rind near the stem end and the entire contents, seeds and meat are scooped out, but the rind is apparently untouched except exit. Rarely is a seed found intact and apparently the rats like seeds very much, but flesh also is devoured and contents completely hollowed out.

Reports have also come from other sections of the State along a similar vein, and it might be advisable for proper State or Federal authorities to ascertain immediately whether or not this may be a foreign pest of a dangerous nature. Then too, is the well known scientific fact that insects develop new likings for certain new hosts which cause damage to entirely new plants hitherto unused by such insects. Quite possibly animals might acquire unnatural and new habits and the citrus industry now has quite enough troubles without any additional worries.

Should any grower have troubles of this nature it might be well to make a complaint to Commissioner of Agriculture Nathan Mayo, who no doubt would make an investigation as a precautionary measure.

Yours very truly,
DONALD J. NICHOLSON,
Private Citrus Researcher, Plant
Breeder and Propagator.

P. S.—I should state that fully 30 to 40% of a heavy crop on 25 trees was lost by rat damage.

Your magazine is very valuable to citrus growers — I have read it for years.

A RESUME OF RESEARCH ON GUMMOSIS IN FLORIDA

(Continued from page 9)

great readiness to the back-scraping method of treatment but, unfortunately, new bark-scaling areas keep developing at points on the trunk and limbs which are often quite remote from the areas previously treated.

The disease also frequently begins to develop anew in previously treated areas where the bark appears to have become perfectly smooth and healthy, three or more years after their treatment. In view of the pronounced tendency for this bark disease to keep breaking out anew, despite treatment, the treatment must be repeated each year in many cases in order to keep the disease under control. A total of 331 cultures have been made from the discolored inner bark under gumming areas on the trunks and main limbs of various tangerine trees at intervals over a period of several years in an effort to isolate the casual organism. Of these, 227 remained sterile, 52 yielded merely miscellaneous bacteria, 22 *Phomopsis citri*, 15 *Diplodia natalensis*, 11 *Fusarium* (nearly all being *F. solani*), 2 *Trichoderma lignorum*, 1 *Aspergillus niger*, and 1 an undetermined organism, possibly a contamination. Here again, the fact that no organism was secured in the majority of cases and that, of those that were isolated, none occurred with any degree of constancy, indicates that the miscellaneous ones obtained were secondary in nature. It is suggested that this bark trouble of tangerine trees may develop as the result of some nutrient deficiency.

Cultivated Lemon

These trees are extremely susceptible to gummosis characterized by copious gum flow, and they appear to be universally affected after they attain a few years of age. The disease develops on the trunk and main limbs, frequently breaking out with considerable activity in some years and healing over more or less in others. While the progress of the trouble appears to be difficult to check by the bark-scraping method of treatment, affected trees seem to withstand the disease for several years without serious effort to their life or crop production. The life of affected trees frequently may be prolonged considerably by inarching sprouts from the rootstock into the trunk or limbs above the upper limits of the disease. Cultivated lemon trees usually are budded on sour orange or rough lemon stock, both of which appear to be resistant to the disease. Since such trees occur only occasionally in groves, the writer has had little opportunity to work with this type of gummosis. Of a total of 196 cultures made from the discolored inner bark of gumming areas on the trunks and main limbs of Italian and Villa Franca lemon trees, 152 remained sterile, 25 yielded merely miscellaneous bacteria, 7 *Fusarium* (mostly

F. solani), 4 *Diplodia natalensis*, 4 *Phomopsis citri*, 1 *Aspergillus niger*, 1 *Penicillium* sp., and 2 unidentified fungi. The fact that no organism was secured in the majority of cases and that, of those that were isolated, none occurred with any degree of constancy, indicates that the miscellaneous ones obtained were secondary in nature. The cause of this type of gummosis still remains a mystery.

Perrine Lemon and Tahiti Lime Trees

A bark disease of young Perrine lemon and Tahiti (Persian) lime trees, resulting in a girdling and dying of limbs or entire trees, is of fairly widespread and common occurrence in several sections of the State where these trees are grown, being quite destructive in some plantings. The disease attacks the trunks and branches and is characterized by a rapid dying of the bark in localized areas or lesions, which may or may not be accompanied by the exudation of gum. Although several fungi have been isolated from the diseased parts, the investigations of Tisdale (4) and others show that *Diplodia natalensis* and *Phomopsis citri*, occur most frequently and are capable of producing the trouble when inoculated into healthy trees. These fungi gain entrance through pruning wounds, growth cracks, thorn punctures, or other forms of bark injury. In addition to attacking the bark, they frequently invade the wood extensively, which results in a rapid girdling of the affected trunks or branches, whereupon the foliage turns yellow and may wither and die within a few days. Once these fungi invade the wood of the attacked trunks or limbs it is usually difficult or impossible to check their advance by surgical treatment.

Both the Perrine lemon and Tahiti lime are much more susceptible to infection and invasion by *Diplodia* and *Phomopsis* than are other kinds of citrus and it appears that any agency which weakens the trees predisposes them to infection by these fungi. The Perrine lemon (a cross between the Genoa lemon and Key or Mexican lime) is much more susceptible to this bark disease than the Tahiti lime. Plantings of this hybrid in parts of Florida have shown such a high mortality from this bark disease as to prove very discouraging and unprofitable to growers. Many growers who feel that the severity of the disease is in direct proportion with growth activity keep their trees yellow and starved through very sparing use of sources of nitrogen. However, this practice does not appear to alleviate the bark disease problem.

It is believed that considerable remains to be learned in regard to the proper fertilization and culture of this tree.

It is more practical to adopt measures to prevent the occurrence of this bark disease than to attempt to control it after it develops. Growers are advised to employ a system of management which will keep the trees in a vigorous condition and to inspect them at frequent intervals to remove diseased parts or treat wounds and injuries to prevent additional infection. Preventive measures recommended by Tisdale (5) comprise handling the trees carefully at all times to prevent unnecessary injury to the bark, the prompt treatment of growth cracks, pruning wounds and other injuries with a safe fungicide, and proper cultural and fertilizer practices to prevent excessively rapid flushes of growth. Both the Perrine lemon and Tahiti lime have been found to be much more susceptible to injury from wound dressings than grapefruit, orange or tangerine trees, and only materials definitely proved to be safe should be used.

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NEW DEPARTMENT OF BOTANY IS SET UP IN AGRICULTURE COLLEGE

Establishment of a department of botany and strengthening of the department of agricultural chemistry in the University of Florida College of Agriculture were announced by Dean H. Harold Hume.

The new department of botany comprises three divisions — general botany, bacteriology, and plant pathology. Dr. W. B. Tisdale, who is also head of the research department of plant pathology in the Experiment Station, is head of the new department.

The LYONIZER

Department

COMPILED BY THE LYONS FERTILIZER CO.

Salesmen Report From The Field

NORTH CENTRAL FLORIDA

George W. Phillips

We reported last month that this section would have less citrus fruits to place on the market this year, but during the past several weeks we have come to the conclusion that this might be the best solution to a bad situation. All of our growers that have had good fertilizer during the past year have a good average crop of real quality fruit and are feeling encouraged over prices. The quality of fruit is better than it has been for a number of years. There is very little activity in the vegetable areas.

POLK AND HIGHLANDS COUNTIES

J. M. Sample

A great many growers in this section are planning to apply a liberal application of mixed fertilizers to their groves in October. This is a little earlier than usual, but a very wise move in view of the heavy rains that we have had this summer. Furthermore this plan of fertilization will give the trees a longer feeding period to assimilate and store up plant food for the spring bloom. The fruit crop is showing up fine. The quality is good, and the sizes are desirable. We feel that this section will have a very good season.

WEST CENTRAL FLORIDA

E. A. McCartney

During the past month we have spent considerable time in the vegetable farming areas. There is a great deal of activity in all these sections and every indication at this time is that there will be about the same acreage of the various crops as was planted last year. There is more interest being shown by the growers in the proper methods of preparing for

planting than ever before. Most of our customers are having their soils checked, discussing their requirements, then using Doliman as a soil conditioner. This interest leads me to believe that we are going to have a fine crop of real quality produce this season. Many of our citrus customers are making plans for an early fall fertilizer application.

SOUTHWEST FLORIDA

Frank Dillinger

Celery growers in the Sarasota section are well under way with their planting, and from now until the season ends this section will be one of much work and little play. While the heavy rains of late summer were detrimental to many seed beds, most of the growers have gone forward with their work, and will have a normal crop under way for the fall season. Quite a large acreage is being planted to eggplant and a number of growers are planning to put in an acreage of lettuce. While our grapefruit crop is somewhat less than our tonnage last year we do have nice quality, and most of the growers feel encouraged over the prospect of getting fair prices.

EAST COAST

F. W. Scott

The recent rains have been very beneficial to vegetable growers in this section, and at this time practically every grower is busy preparing for fall planting. The lake section is going forward with their planting and indications are that the crop will be about normal as far as acreage is concerned. Beans, as usual, will be the big crop in this territory. The sections around Dania and Pompano are making ready for the fall crops, and in many cases planting is under way.

Personal Items

One of our very good customers in Pinellas county, Mr. Joe M. Knight can boast of an excellent crop of quality fruit this season. These properties carried an unusually heavy crop last year, but have come back with another bumper crop this season. The quality of this fruit certainly shows very definitely the value of good fertilizer.

The Highlands Seed Company, under the capable management of S. P. Daugherty, opened their doors for business the first of September. These people are agents for our Company, and in addition to this account they are handling a complete line of insecticides, seeds, feeds and garden supplies. Shirley Daugherty is a wide awake young man that you will find very pleasant and thorough in all business transactions.

Bill Stockbridge, Sarasota, prominent celery grower, has his celery planting under way. Bill is one of the best celery men in this section, and very consistently produces bumper crops of outstanding quality.

HILLSBOROUGH AND PINELLAS COUNTIES

C. S. Little

While the rains of the late summer have been detrimental to those growers interested in planting vegetables this fall, they have been fine for the citrus growers all over the territory. Our groves are looking fine at this time with an excellent flush of growth making an appearance during the past few weeks. Our tonnage of fruit will be less than last year but the quality is good, and most growers feel that they will get a good price for what they have to sell. Most of our growers are planning to fertilize their groves early this fall.

A great deal of interest is being shown in the farming section around Lake Istapoga in Highlands county. Several of the gladioli growers are moving their operations to this section for this season. This is considered one of the best winter vegetable areas in the state.

OCTOBER SUGGESTIONS FOR GROVE AND FARM CARE

Prepared by Horticultural Department, Lyons Fertilizer Co.

CULTIVATION

It is advisable to cut in your cover crop just as soon as your seed are mature. If the cover crop is unusually rank it will be well to use cover crop cutter before putting the disk to work. We have seen quite a few pumpkin bugs. Cutting cover crops will help keep this insect under control. Work out young trees with hoe.

PEST CONTROL

Rust mite are very active. Keep a close check, and keep them under control with dusting sulphur or spray with lime sulphur. All vegetable growers should see that their insecticide agents have stock of material on hand to take care of their requirements.

FERTILIZER

Make your fall fertilizer application this month. Trees are getting hungry, and furthermore a good application of mixed fertilizer at this time will play an important part in setting a good crop of fruit next spring. The Lyons field man will be glad to consult with you on the proper analysis to apply.

It is very important to keep our vegetable crops growing. This can be done through the liberal use of mixed fertilizers, and we will be glad to consult with you on the proper analysis to use.

COVER CROPS

Cover crop will be cut in along with fall cultivation. However the grass crop growing along fence rows and ditches should be destroyed as a fire hazard.

PRUNING

Remove all dead wood from trees and keep down water-sprouts.

Prof. W. O. Smith, of Frostproof, a loyal Lyons customer, states that his groves, as usual, are in fine condition. We appreciate this compliment and since Mr. Smith has been using our fertilizer for a number of years we take pride in suggesting that you look over the property as you ride out of Frostproof going north. The groves are on the south side of the first lake that you will be able to see.

Buddy Cox of Lake Alfred, is doing a fine job of managing his father's citrus interests. The groves are in good condition and speak for themselves

Watson Farms, Inc., Lakeland, under the supervision of Mr. R. E. Betz is developing a very fine agricultural project on the north side of Lake Parker. These people have included a program of pasture improvements along with their general farming operations and have constructed several nice silos to take care of their home grown feed.

We convinced ourselves a long time ago that the most economical method of producing quantities of quality fruit was to use the very best mixed fertilizer, give groves adequate amounts of fertilizer, and follow spray program that would consistently keep diseases and insects under control. While this program will necessarily mean a larger outlay of cash, it also will mean that the inlay at the end of the season will result in a nice profit from the grove. We know of plenty of growers that are making money every year. We know others that are not making money. The only difference is that the man making money spent some money on his property, and the man that got red ink blotted out his chances of a profit all along through the season by hit and miss operations. You can consult all "experts" you want to see, but over a period of years you will find that the program outlined above is the only real year in and year out sure way of keeping black ink on the books.

SIMPLE RECIPE

"Making love is like making pie. All you need is a lot of crust and some applesauce."

Little Bits of FUN



BIG HELP

"Did you mail those two letters I gave you, Norah?"

"Yes'm, at the postoffice. But I noticed that you'd put the two-cent stamp on the foreign letter, and the five-cent stamp on the city one."

"Oh, dear, what a blunder."

"But I fixed it all right, ma'am. I just changed the addresses on the envelopes."

OMNIBUS

Scotchman (at riding academy):

"I wish to rent a horse."

Groom: "How long?"

The Scotchman: "The longest you've got, laddie. There be five of us going."

HEROIC

First Boy: "My father is a brave man, he is. He killed five lions and an elephant in Africa, single-handed."

Second Boy: "Bosh, that' nothing, my Dad bought a new sedan when ma wanted a coupe."

COMMUNISM

"Your communism is stupid. If everything were divided today, in a very short time your portion would be gone. What then?"

"Divide again."

"Heah, Rastus, is that quarter I borrowed from you two years ago."

"Y'all might jus' as well keep yo' money. It ain't wuth two bits for me to change mah opinion o' you."

"Lesh go home now, Joe."

"Naw, I'm afraid to go home. Wife'll shmell m' breath."

"Hol' your breath."

"Can't. Sh'too strong."

"What's inertia, Dad?"

"Well, if I have it, it's sheer laziness; but if your mother has it, it's nervous prostration."

Florida Still Leads ... In Citrus

Despite tremendous increases in production, particularly in Texas grapefruit, in the last few years, Florida continues to hold a dominating position in the citrus industry of the United States, growing nearly one-half of the 122,500,000 boxes produced in this country during the 1938-39 season.

This is shown by the annual citrus summary of the federal-state market news service, compiled by H. F. Wulson, which will be ready for distribution in a few days.

It was the second year more than 100,000,000 boxes of citrus had been produced in the United States, the summary shows, with 102,454,000 boxes in the 1937-38 season and 122,495,000 boxes for the season just closed.

Florida's production of oranges, grapefruit and tangerines amounted to 57,600,000 boxes, compared with 41,300,000 in 1937-38, an increase of more than 16,000,000 boxes. California had a slight decrease in production of both oranges and grapefruit, but Texas jumped ahead substantially in grapefruit. Other citrus states produced about the same amount as a year ago.

Florida kept pace with the increase in national production of oranges, the five-year average tabulation from 1923 to 1938 in the annual citrus report showing a gain from 9,997,000 boxes to 23,740,000 boxes, while total U. S. production for the same period rose from 29,809,000 to 64,414,000. Grapefruit production in Florida lagged somewhat behind national figures, due principally to large Texas gains.

National production of grapefruit increased from 7,523,000 to 29,029,000 boxes, or about 400 per cent. Florida's grapefruit production increased from 7,077,000 to 16,620,000 boxes during the same period, or only 200 per cent. Texas accounts for this national gain to a large extent, the five-year average tabulation showing that state rising from 21,000 boxes to 8,518,000 boxes, or 400 times as much.

Movement of Florida's crop last season produced many new records, including amount of fruit shipped, length of season and shipments during single weeks. The peak week last season came on Dec. 17, when

4,818 cars went to market, nearly 1,000 more than the same week a year before. Three thousand cars a week was a common occurrence during the 1938-39 season, with three weeks in December showing that much fruit moved, and starting with the first week in January there were 13 consecutive weeks when the total movement exceeded 3,000 cars.

Through August 19, the summary shows 107,719 cars of Florida citrus went to market, the first time it has gone over the 100,000-car mark. During the 1937-38 season, 80,287 cars were shipped.

Volume shipments extended over the longest period in history. While past seasons show scattering shipments in late summer, this year there was a heavy movement in June which continued through July when nearly 1,000,000 boxes were shipped. August shipments also were relatively large, with an occasional car still being shipped in early September.

Commercial cannery output broke all records during the season, the citrus report shows, accounting for 1,187,544 boxes of oranges and 3,481,053 boxes of grapefruit through the week of Aug. 26. The federal government's surplus commodity program was responsible for diverting 3,645,589 boxes of citrus from the commercial channels, including 1,747,224 boxes of grapefruit and 41,865 boxes of oranges diverted by the grower to take advantage of government purchases amounting to 739,451 boxes of grapefruit for canning and 908,222 boxes of grapefruit for fresh fruit shipment. In addition, the government purchases 208,827 boxes of oranges for fresh fruit use.

"As would be expected with a large volume of fruit," the summary states, "prices were relatively low. There were nearly 5,000 more cars

of Florida oranges sold on the 10 auction markets than in previous season, or 25,224 cars at \$2.09 compared with 20,686 cars at \$2.24 in 1937-38, a decrease of 15 cents a box. The volume of Florida oranges sold on the auctions has increased sharply the past few years. The volume in 1938-39 was approximately 2½ times that of 1926-27 and 1929-30, and more than three times that of the 1927-28 season. Compared to the more recent seasons or in round figures 10,000 more cars 1931-32 through 1936-37, there were sold this year than the average of these former seasons.

"California prices also were lower or a decrease of 30 cents from a year ago. Total sales of California oranges on the auctions were 17,157 cars averaging \$2.82 per box compared with 15,549 cars in 1937-38 which sold for an average of \$3.12."

Grapefruit prices on the auction markets also decreased, the summary shows, with 10,926 cars of Florida grapefruit being sold for an average of \$1.72, against 8,555 cars in 1937-38 at \$2.16. The lowest previous price was in 1934-35 when 9,759 cars brought an average of \$2 a box. In contrast to oranges, the summary points out, the volume of Florida grapefruit sold on the leading auctions during recent seasons has been about the same and shows no decided increase.

"During the seven-year period prior to 1938-39," the summary continues, "the number of cars of Florida grapefruit ranged mostly from 8,000 to 10,000 cars. In comparing the volume of grapefruit sold on the auctions with oranges, one should keep in mind that an increasing volume of grapefruit is being canned and that the Texas grapefruit industry is expanding rapidly with result-

(Continued on page 17)



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National-Riverside Co. 3 and 9 Gallon
P.O. Box 925, Tampa, Florida Smudge Pot

American Farmers Used 7,500,000 Tons of Fertilizer in 1938

As a part of their program to increase the productivity of their land, to increase their profits, and to prevent soil erosion, the farmers of the United States used 7,504,000 tons of commercial fertilizer in the year 1938. This was a decline of nearly 600,000 tons from 1937. The National Fertilizer Association reports, but with that exception it was by far the largest tonnage for any year since 1930.

The decline in fertilizer consumption in 1938 was expected, in view of the recession in farm purchasing power which began in the fall of 1937. Farm income is the principal factor determining the amount of fertilizer used, and the two usually fluctuate together. They both reached the depression low point in 1932, increased in each of the five succeeding years, and then declined in 1933. Both of them have been at about the same levels in the early months of 1939 as in the corresponding period of 1938.

Although total tonnage for the entire country fell off about 8 per cent, several of the western States reported increases in 1938. The trend of consumption in that region is rising more rapidly than in the older fertilizer-using areas in the East and South. The Southeast remains the most important section from the standpoint of fertilizer use, with North Carolina the only State in the country to use more than a million tons a year. The five leading States — the Carolinas, Georgia, Florida, and Alabama — used 48 per cent of all the fertilizer sold in 1938.

In addition to the tonnage mentioned above, which represents the volume sold by the commercial fertilizer industry, the Agricultural Adjustment Administration continued its distribution of superphosphate under the Soil Conservation Program, having furnished about 63,000 tons to farmers in 1938.

Although farmers purchased about a half a million tons less of fertilizer in 1938 than they did in 1923, they actually got more plant food last year with the smaller tonnage than they had gotten ten years earlier. This was due to the fact that there has been a steady increase in the amount of plant food in a ton of fertilizer. The farmer benefits by this change and it is to his advantage to buy the higher analyses. Fertilizers have been improved in other

ways also.

It is interesting to note that while farmers got more plant food in their fertilizer in 1938 than in 1928, their fertilizer bill was 30 per cent less than ten years ago. Fertilizer is one of the cheapest things farmers buy, the U. S. Department of Agriculture reports. The Department's price records show that fertilizer is now at the pre-war level, while all commodities farmers buy, on the average, are 20 per cent above pre-war.

When retirement age arrives the last to realize it is the man who should retire.

FLORIDA STILL LEADS IN CITRUS (Continued from page 16) ant competition particularly in the middle west."

The annual citrus summary contains all tables previously utilized and several new ones which it was felt would be of interest to the Florida industry. Tables of distribution, weekly auction prices on the various markets, and many other statistical tabulations are included. Daily reports by the federal-state market news service will be resumed as soon as movement of fruit from the new crop warrants, Mr. Wilson said.

Enrich your soil and Reduce production costs



Duplex Cover Crop Cutter on Isleworth Grove of Chase & Co., — reducing their hoeing costs. This company's eighth machine

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TIMKEN
ROLLER BEARINGS

Marden Manufacturing Co.

Auburndale — Florida

BRITISH GOVERNMENT LICENSSES LUXURY FOOD IMPORTS

An order prohibiting imports into the United Kingdom of certain goods, except under license, has been issued by the British Board of Trade, according to the Office of Foreign Agricultural Relations, U. S. Department of Agriculture. The object of the order is to limit imports of luxuries and of goods of which there are sufficient home supplies in order to conserve exchange for the purchase of other products required in war time.

The only agricultural products thus far made subject to the licensing feature are certain luxury foodstuffs. In the latter category are included fresh fruit (other than apples, pears, bananas, grapefruit and limes), honey, nuts, canned vegetables (other than tomatoes), fresh vegetables (other than potatoes, tomatoes and onions), fruit juices, hops, and licorice. A long list of non-agricultural products was made subject to the licensing requirement.

It was emphasized by the Board of Trade that the adoption of the licensing arrangement does not mean that the items listed cannot be imported. In granting import licenses the foreign exchange situation will be the dominating factor. However, shipping space and the war requirements of other goods also will be taken into consideration.

Since the objective is to save exchange in order to utilize dollar resources for the importation of abso-

THE CITRUS INDUSTRY

lute necessities, it is believed that a virtual ban will be imposed on the importation of all luxury and semi-luxury items which can be supplied in adequate volume by home resources.

FLORIDA CITRUS SHIPPING SEASON OPENS LATER THAN USUAL

(Continued from page 7)
ned grapefruit to Great Britain, now Florida's best customer for this product. The next few weeks will give some indication, it is believed, whether Florida's canned grapefruit export business will be affected one way or the other. One out of every three to four cases of canned grapefruit produced in Florida now goes to Great Britain.

Most Florida citrus leaders predict a better season than for several years, basing their opinion on several factors. These include lessened competition from California because of the small size of California's oranges now being marketed, operation of the marketing agreement from the start of the shipping season, and a hoped for rise in economic conditions.

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CITRUS NURSERY TREES

Superior Trees at Special Low Summer Prices. Send for Price List. Ward's Nursery, Avon Park, Fla.

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For Sale At Bargain

This packing house is in an ideal location in the very center of the citrus belt in a town where fullest co-operation may be expected.

The plant itself is suitable for either, packing, canning or juicing plant. Could be most advantageously handled either as a co-operative or individual enterprise.

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Medical Men Say Vitamins Should be Eaten

Recent announcement by the American Medical association that vitamins should be obtained from food, as against capsules or other vitamin mixtures, should have a beneficial effect on orange and grapefruit consumption among certain groups of people, the Florida citrus commission believes.

The medical association, in a report published in its journal, stated that taking vitamin mixtures "cannot replace the need of adequate amounts of a well-balanced diet."

The average diet does not contain a sufficient amount of Vitamins A and C, the association also reported, warning that many persons get enough vitamins for passable health but not enough for buoyant health.

Oranges and grapefruit are rich in Vitamin C and also considered good sources of Vitamin A. Officials of the citrus commission have been watching development of the vitamin mixtures, many of which are now on the market and purport to contain all or several of these essential elements. No noticeable effect on citrus sales has been reported, but it is believed the medical association's findings probably will result in a sharp break in the rapid rise such mixtures have shown.

The commission has capitalized in many ways on available vitamin knowledge, stressing the abundance of these healthful elements in Florida citrus fruits, although still being guided basically by the established fact that people eat foods they like, rather than those which are good for them.

"We have been wondering when the American Medical association or some other group would 'clamp down' on these vitamin mixtures," one official said. "No doubt these mixtures are needed in certain instances, when prescribed by doctors, but we have always felt nature intended vitamins to be obtained from ordinary foods, and not in pill form. The orange and grapefruit have the happy combination of good taste and vitamin richness. There is no necessity for any normal person to take capsules to get enough Vitamin C, with oranges and grapefruit as reasonable and abundant as they now are."

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